

What is claimed is:

1. An optical image recording material comprising an oxetane compound containing one to four oxetane rings in the molecule, a cationic photopolymerization initiator and a matrix forming precursor substance.

2. The optical image recording material of Claim 1, further comprising a compound containing an epoxy group in the molecule.

3. The optical image recording material of Claim 1, further comprising a compound containing a vinyl ether group in the molecule.

4. The optical image recording material of Claim 1, further comprising:

- (i) a compound containing an acryloyl group or
- (ii) a metacryloyl group in the molecule; and
- (iii) a photo radical polymerization initiator.

5. The optical image recording material of Claim 1, wherein the matrix forming precursor substance is capable of

forming a binder-matrix with at least one polymerization reaction selected from the group consisting of epoxy - amine step polymerization, epoxy - mercaptan step polymerization, unsaturated ester - amine step polymerization, unsaturated ester - mercaptan step polymerization, vinyl-silicone hydride step polymerization, isocyanate - hydroxyl step polymerization, and isocyanate - amine step polymerization.

6. The optical image recording material of Claim 1, wherein the matrix forming precursor substance is represented by Formula (I):

Formula (I)



wherein M is a metallic atom having an atomic valence of not less than trivalent, R is an alkyl or allyl group, R' is a lower alkyl group having carbon atoms of not more than four, and "n" is 1 or 2.

7. The optical image recording material of Claim 6, wherein M in Formula (I) is a metallic atom selected from the group consisting of silicon, titanium, germanium, zirconium, vanadium, and aluminum.

8. An optical image recording material comprising a first substrate, a second substrate, and an optical image recording layer between the first and the second substrate,

wherein the optical image recording layer contains an oxetane compound having one to four oxetane rings, a cationic photopolymerization initiator, and a matrix forming precursor substance.

9. The optical image recording material of Claim 8, wherein a thickness of the first substrate (D_1) and the second substrate (D_2) satisfies the following relationship:

$$0.5 \leq D_1/D_2 \leq 2.0$$

10. The optical image recording material of Claim 8 containing a binder-matrix obtained by curing a portion of the matrix forming precursor substance.

11. A hologram material obtained by applying holography recording irradiated with active rays onto the optical image recording material of Claim 10.

12. An optical image recording material comprising a first substrate, a second substrate, and an optical image recording layer between the first and the second substrate,

wherein the optical image recording layer contains an oxetane compound having one to four oxetane rings in the molecule, a cationic photopolymerization initiator, and a binder-matrix.

13. A hologram material comprising a first substrate, a second substrate, and an optical image recording layer between the first and the second substrate,

wherein the hologram material contains:

(i) a binder-matrix; and

(ii) a polymer obtained by irradiating with active rays to an oxetane compound having one to four oxetane rings in the molecule.

14. An optical image recording method using the optical image recording material described in Claim 8 comprising the steps of:

a) forming a binder-matrix by curing a portion of the matrix forming precursor substance; and

b) conducting hologram recording by irradiating with active rays onto the optical image recording material.

15. The production method of the optical image recording material described in Claim 12, comprising the steps of:

a) mixing an oxetane compound containing one to four oxetane rings in the molecule, a matrix forming precursor substance, and a cationic photopolymerization initiator; and

b) forming a binder-matrix by curing a portion of matrix forming precursor substance.

16. The production method the hologram material described in Claim 13, comprising the steps of:

a) mixing an oxetane compound containing one to four oxetane rings in the molecule, a matrix forming precursor substance, and a cationic photopolymerization initiator;

b) forming a binder-matrix by curing a portion of matrix forming precursor substance; and

c) conducting hologram recording by irradiating with active rays onto the optical image recording material.